

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
GAMMA ANALYSES**

REPORT OF SAMPLE DELIVERY GROUP #1900152

Project: Canadian Radium and Uranium 9/19
 Analysis method: Gamma-ray Spectrometry - Sealed Radium Cans
 Report ID: 1900152-GAMMA-RA
 Report type: Original
 Date reported: 12/04/2019
 Total pages in report: 30

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B9.10537D	C008-SB001-036048-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10538E	C008-SB001-036048-02	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10539F	C008-SB001-108120-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10540Y	C008-SB002-024036-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10541Z	C008-SB002-060072-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10542A	C008-SB003-000012-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10543B	C008-SB003-072084-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10544C	C008-SB004-012024-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10545D	C008-SB004-084096-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10546E	C008-SB005-036048-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10547F	C008-SB005-060072-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10548G	C008-SB006-024036-01	NY:MT. KISCO	SOIL	09/08/2019	09/10/2019
B9.10549H	C008-SB006-060072-01	NY:MT. KISCO	SOIL	09/09/2019	09/10/2019
B9.10550A	C008-SB007-024036-01	NY:MT. KISCO	SOIL	09/09/2019	09/10/2019
B9.10551B	C008-SB007-060072-01	NY:MT. KISCO	SOIL	09/09/2019	09/10/2019
B9.10552C	C008-SB008-048060-01	NY:MT. KISCO	SOIL	09/09/2019	09/10/2019
B9.10553D	C008-SB008-084096-01	NY:MT. KISCO	SOIL	09/09/2019	09/10/2019
B9.10554E	C008-SB009-000012-01	NY:MT. KISCO	SOIL	09/09/2019	09/10/2019
B9.10555F	C008-SB009-072084-01	NY:MT. KISCO	SOIL	09/09/2019	09/10/2019

EXCEPTIONS

- Packaging and shipping** – Upon inspection at NAREL, it was discovered that the lid on sample B9.10551 was off the container. Client was informed and instructed NAREL to proceed with analysis of the sample as received.
- Documentation** – No problems were observed.
- Sample preparation** – No problems were encountered.
- Analysis** – Samples were held for 21 days to allow for ingrowth. Client requested that NAREL report the following: Bi-212, Bi-214, Cs-137, K-40, Pb-210, Pb-212, Pb-214, Ra-226, Ra-228, Th-234, Tl-208, and U-235. Please see page 4 of this report with regards to exceptions for reporting of some of the nuclides in this list. For Pb-210 in soil samples, NAREL flags the results because of the larger uncertainty associated with gamma-ray attenuation in uncharacterized materials at low energies (46.5 keV).
- Holding times** – No holding times were specified.

ACCREDITATION



NAREL is accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard. NAREL maintains accreditation for all its radiological analyses except the following:

- Analyses of drinking water
- Gross alpha and gross beta of solid matrices, including swipes
- Tritium analysis of solid matrices, including swipes
- Analyses for Ra-226 by method NAREL RA-07-EC
- Analyses for Am-241 by method NAREL ACT-02F
- Curium-244/243

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert 12/5/19
Velinda Herbert

Date

Quality Assurance Manager, NAREL

Cynthia White
Cynthia White

Date

Director, Center for Environmental Radioanalytical
Laboratory Science

12-4-19

If you have questions about the data, please contact Cynthia White (white.cindy@oregon.gov).

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
LCX	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "Z scores." A Z score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The Z score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The Z score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

GENERAL INFORMATION (CONTINUED)

GAMMA ANALYSIS

The reporting format lists the gamma emitters in alphabetical order. The activity, 2-sigma uncertainty, and a sample-specific estimate of the MDC for radionuclides measured by gamma spectroscopy are reported only if the nuclide is detected above background with the exception of client requested nuclides of interest. The activity for each of the requested nuclides is reported whether negative, positive, or zero along with the associated 2-sigma uncertainty and the sample-specific estimate of the MDC.

Due to potential spectral interferences and other possible problems associated with the determination of the activity of certain radionuclides, the activities for ^{212}Bi , ^{212}Pb , ^{208}Tl , ^{210}Pb , ^{214}Bi , ^{214}Pb , ^{234}Th , $^{234\text{m}}\text{Pa}$, ^{226}Ra , ^{231}Th , and ^{235}U are subject to greater uncertainty than other commonly reported radionuclides. It should be noted that this potential uncertainty is not included in the two-sigma expanded uncertainty that is reported with each result. Although in this report we do provide the calculated activities for these radionuclides, we recommend that the results be used only as a qualitative means of indicating the presence of these radionuclides and not as a quantitative measure of their concentration. The results for these nuclides are not used in the evaluation of quality control samples. Furthermore, because of mutual interference between ^{226}Ra and ^{235}U , NAREL's gamma analysis software tends to overestimate the amounts of these nuclides whenever both are present in a sample. Lower estimates for ^{226}Ra activities can be obtained from the reported activities of its decay products, ^{214}Pb and ^{214}Bi , which are likely to be somewhat less than the ^{226}Ra activity because of the potential escape of radon gas.

NAREL's gamma-ray spectrometry software corrects activities and MDCs for decay between collection and analysis, but only up to a limit of twelve half-lives. If the decay time for a sample exceeds twelve half-lives of a radionuclide, that radionuclide is not reported. This software feature may affect results for short-lived radionuclides, such as ^{131}I and ^{140}Ba , when there is a long delay between collection and analysis.

CHAIN OF CUSTODY RECORD
 Canadian Radium & Uranium Company
 Contact Name: Bernard Nwosu
 Contact Phone: 908-555-2980

No: 2-090919-0032-0030-0001

Lab: NAREL

Lab Contact: Tonya Hudson

Lab Phone: 343-270-3433

Lab #	Sample #	Location	Matrix	Analyses	Sample Date	Sample Time	Sample Cont.	Container	Preservative	Lab QC
C008-SB001-0350248-01 ✓	C008-SB001	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	14:10	/2	32 oz poly	None	Y 34105370	
C008-SB001-035048-02 ✓	C008-SB001	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	14:10	1	32 oz poly	None	N 3210538E	
C008-SB001-108120-01 ✓	C008-SB001	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	14:15	1	32 oz poly	None	N 3210539F	
C008-SB002-024036-01 ✓	C008-SB002	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	15:25	1	32 oz poly	None	N 3210540Y	
C008-SB002-062072-01 ✓	C008-SB002	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	15:30	1	32 oz poly	None	N 3210541Z	
C008-SB003-060012-01 ✓	C008-SB003	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	16:15	1	32 oz poly	None	N 3210542A	
C008-SB003-072084-01 ✓	C008-SB003	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	16:20	1	32 oz poly	None	N 3210543B	
C008-SB004-012024-01 ✓	C008-SB004	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	16:50	1	32 oz poly	None	N 3210544C	
C008-SB004-084096-01 ✓	C008-SB004	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	16:55	1	32 oz poly	None	N 3210545C	
C008-SB005-036048-01 ✓	C008-SB005	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	17:35	1	32 oz poly	None	N 3210546E	
C008-SB005-062072-01 ✓	C008-SB005	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	17:40	1	32 oz poly	None	N 3210547F	
C008-SB006-024036-01 ✓	C008-SB006	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	18:15	1	32 oz poly	None	N 3210548G	
C008-SB006-062072-01 ✓	C008-SB006	Soil	Alpha Spec (U, Th) & Gamma Spec	9/8/2019	18:20	1	32 oz poly	None	N 3210549H	
C008-SB007-024036-01 ✓	C008-SB007	Soil	Alpha Spec (U, Th) & Gamma Spec	9/9/2019	08:20	1	32 oz poly	None	N 3210550A	
C008-SB007-062072-01 ✓	C008-SB007	Soil	Alpha Spec (U, Th) & Gamma Spec	9/9/2019	08:25	1	32 oz poly	None	N 3210551B	
C008-SB008-048060-01 ✓	C008-SB008	Soil	Alpha Spec (U, Th) & Gamma Spec	9/9/2019	09:35	1	32 oz poly	None	N 3210552C	
C008-SB008-084096-01 ✓	C008-SB008	Soil	Alpha Spec (U, Th) & Gamma Spec	9/9/2019	09:40	1	32 oz poly	None	N 3210553D	
C008-SB009-024036-01 ✓	C008-SB009	Soil	Alpha Spec (U, Th) & Gamma Spec	9/9/2019	10:00	1	32 oz poly	None	N 3210554E	
C008-SB009-072084-01 ✓	C008-SB009	Soil	Alpha Spec (U, Th) & Gamma Spec	9/9/2019	10:05	1	32 oz poly	None	N 3210555F	

Special Instructions: Please email results to sumbaray@westonsolutions.com and ben.nwosu@westonsolutions.com. Samples to be run for isotopic thorium via NAREL ACT-02FT-H, Isotopic Uranium via NAREL ACT-02F-U, other gamma isotopes via NAREL GM-01-RA, and Radium-226 and Radium-228 via 21-day ingrowth. 60 day TAT.

SAMPLES TRANSFERRED FROM
CHAN OF CUSTODY #

Item/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All Samples	Richard J. (Weston) (Weston)	9/11/19 06:00	✓	9/11/19 06:00	Most Good, 1 sample missing a lid

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

ANALYSIS SUMMARY

Analysis method: NAREL GAM-01-RA
 Title: Gamma-ray Spectrometry - Sealed Radium Cans

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B9.10537D	C008-SB001-036048-01		11/20/2019	0016824G	0024721G
B9.10537D	C008-SB001-036048-01	DUP	11/21/2019	0016824G	0024721G
B9.10538E	C008-SB001-036048-02		11/20/2019	0016824G	0024721G
B9.10539F	C008-SB001-108120-01		11/20/2019	0016824G	0024721G
B9.10540Y	C008-SB002-024036-01		11/21/2019	0016824G	0024721G
B9.10541Z	C008-SB002-060072-01		11/26/2019	0016824G	0024721G
B9.10542A	C008-SB003-000012-01		11/21/2019	0016824G	0024721G
B9.10543B	C008-SB003-072084-01		11/22/2019	0016824G	0024721G
B9.10544C	C008-SB004-012024-01		11/23/2019	0016824G	0024721G
B9.10545D	C008-SB004-084096-01		11/21/2019	0016824G	0024721G
B9.10546E	C008-SB005-036048-01		11/23/2019	0016824G	0024721G
B9.10547F	C008-SB005-060072-01		11/23/2019	0016824G	0024721G
B9.10548G	C008-SB006-024036-01		11/22/2019	0016824G	0024721G
B9.10549H	C008-SB006-060072-01		11/22/2019	0016824G	0024721G
B9.10550A	C008-SB007-024036-01		11/23/2019	0016824G	0024721G
B9.10551B	C008-SB007-060072-01		11/22/2019	0016824G	0024721G
B9.10552C	C008-SB008-048060-01		11/23/2019	0016824G	0024721G
B9.10553D	C008-SB008-084096-01		11/22/2019	0016824G	0024721G
B9.10554E	C008-SB009-000012-01		11/26/2019	0016824G	0024721G
B9.10555F	C008-SB009-072084-01		11/26/2019	0016824G	0024721G
LCS-00786576D *		LCS	11/20/2019	0016824G	0024721G
RBK-00786575C *		RBK	11/21/2019	0016824G	0024721G

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10537D	Amount analyzed:	5.972e+02 GDRY
Client sample ID:	C008-SB001-036048-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 14:10 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	94.64 %	Analyst:	JEA
Ash/dry weight:	95.64 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/19/2019 14:08	1000.0	GE15	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	8.41e-01	1.6e-01	6.6e-02	1.3e-01	PCI/GDRY	09/08/2019 14:10 EDT
Bi214	J	1.66e+00	1.8e-01	1.0e-02	2.0e-02	PCI/GDRY	09/08/2019 14:10 EDT
Cs137		1.82e-02	5.2e-03	3.7e-03	7.4e-03	PCI/GDRY	09/08/2019 14:10 EDT
K40		1.71e+01	1.9e+00	3.8e-02	7.7e-02	PCI/GDRY	09/08/2019 14:10 EDT
Pb210	J	1.91e+00	3.2e-01	1.5e-01	3.0e-01	PCI/GDRY	09/08/2019 14:10 EDT
Pb212	J	9.53e-01	1.1e-01	1.1e-02	2.2e-02	PCI/GDRY	09/08/2019 14:10 EDT
Pb214	J	1.94e+00	2.1e-01	1.2e-02	2.5e-02	PCI/GDRY	09/08/2019 14:10 EDT
Ra226	J	2.44e+00	3.1e-01	1.0e-01	2.1e-01	PCI/GDRY	09/08/2019 14:10 EDT
Ra228		6.83e-01	7.9e-02	1.8e-02	3.7e-02	PCI/GDRY	09/08/2019 14:10 EDT
Th234	J	4.91e-01	2.1e-01	1.4e-01	2.8e-01	PCI/GDRY	09/08/2019 14:10 EDT
Tl208	J	2.22e-01	2.7e-02	5.4e-03	1.1e-02	PCI/GDRY	09/08/2019 14:10 EDT
U235		2.15e-02	4.6e-02	3.8e-02	7.6e-02	PCI/GDRY	09/08/2019 14:10 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10537D	Amount analyzed:	5.892e+02 GDRY
Client sample ID:	C008-SB001-036048-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 14:10 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	94.64 %	Analyst:	JEA
Ash/dry weight:	95.64 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/20/2019 09:57	1000.0	GE15	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date
Bi212	J	8.47e-01	1.5e-01	6.1e-02	PCI/GDRY	09/08/2019 14:10 EDT
Bi214	J	1.67e+00	1.8e-01	1.0e-02	PCI/GDRY	09/08/2019 14:10 EDT
Cs137		1.76e-02	5.0e-03	3.6e-03	PCI/GDRY	09/08/2019 14:10 EDT
K40		1.72e+01	1.9e+00	4.4e-02	PCI/GDRY	09/08/2019 14:10 EDT
Pb210	J	1.93e+00	3.0e-01	1.4e-01	PCI/GDRY	09/08/2019 14:10 EDT
Pb212	J	1.06e+00	1.2e-01	1.1e-02	PCI/GDRY	09/08/2019 14:10 EDT
Pb214	J	1.94e+00	2.1e-01	1.2e-02	PCI/GDRY	09/08/2019 14:10 EDT
Ra226	J	2.44e+00	3.1e-01	9.8e-02	PCI/GDRY	09/08/2019 14:10 EDT
Ra228		7.21e-01	8.3e-02	1.7e-02	PCI/GDRY	09/08/2019 14:10 EDT
Th234	J	6.04e-01	2.5e-01	1.5e-01	PCI/GDRY	09/08/2019 14:10 EDT
Tl208	J	2.18e-01	2.6e-02	5.1e-03	PCI/GDRY	09/08/2019 14:10 EDT
U235		3.00e-02	4.6e-02	3.8e-02	PCI/GDRY	09/08/2019 14:10 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10538E	Amount analyzed:	6.046e+02 GDRY
Client sample ID:	C008-SB001-036048-02	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 14:10 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	93.01 %	Analyst:	JEA
Ash/dry weight:	95.21 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/19/2019 14:11	1000.0	GE18	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	8.46e-01	1.4e-01	6.9e-02	1.4e-01	PCI/GDRY	09/08/2019 14:10 EDT
Bi214	J	2.09e+00	2.3e-01	1.1e-02	2.2e-02	PCI/GDRY	09/08/2019 14:10 EDT
Cs137		2.08e-02	8.8e-03	5.2e-03	1.1e-02	PCI/GDRY	09/08/2019 14:10 EDT
K40		1.72e+01	1.9e+00	5.0e-02	1.0e-01	PCI/GDRY	09/08/2019 14:10 EDT
Pb210	J	2.00e+00	3.1e-01	1.5e-01	3.0e-01	PCI/GDRY	09/08/2019 14:10 EDT
Pb212	J	7.19e-01	8.0e-02	1.1e-02	2.3e-02	PCI/GDRY	09/08/2019 14:10 EDT
Pb214	J	2.40e+00	2.6e-01	1.5e-02	3.1e-02	PCI/GDRY	09/08/2019 14:10 EDT
Ra226	J	3.03e+00	3.9e-01	1.3e-01	2.7e-01	PCI/GDRY	09/08/2019 14:10 EDT
Ra228		7.87e-01	9.4e-02	3.0e-02	6.0e-02	PCI/GDRY	09/08/2019 14:10 EDT
Th234	J	5.32e-01	1.9e-01	1.4e-01	2.8e-01	PCI/GDRY	09/08/2019 14:10 EDT
Tl208	J	2.70e-01	3.2e-02	7.4e-03	1.5e-02	PCI/GDRY	09/08/2019 14:10 EDT
U235	J	4.93e-02	5.6e-02	4.5e-02	9.1e-02	PCI/GDRY	09/08/2019 14:10 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

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NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10539F	Amount analyzed:	2.248e+02 GDRY
Client sample ID:	C008-SB001-108120-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 14:15 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	59.03 %	Analyst:	JEA
Ash/dry weight:	91.71 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/19/2019 14:09	1000.0	GE16	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date
Bi212	J	1.01e+00	1.6e-01	6.1e-02	PCI/GDRY	09/08/2019 14:15 EDT
Bi214	J	5.98e-01	7.0e-02	1.3e-02	PCI/GDRY	09/08/2019 14:15 EDT
Cs137		-5.25e-03	7.4e-03	6.0e-03	PCI/GDRY	09/08/2019 14:15 EDT
K40		1.12e+01	1.2e+00	4.4e-02	PCI/GDRY	09/08/2019 14:15 EDT
Pb210	J	5.50e-01	1.3e-01	8.0e-02	PCI/GDRY	09/08/2019 14:15 EDT
Pb212	J	9.74e-01	1.1e-01	1.2e-02	PCI/GDRY	09/08/2019 14:15 EDT
Pb214	J	7.16e-01	8.2e-02	1.2e-02	PCI/GDRY	09/08/2019 14:15 EDT
Ra226	J	1.48e+00	2.3e-01	9.8e-02	PCI/GDRY	09/08/2019 14:15 EDT
Ra228		8.55e-01	9.9e-02	1.8e-02	PCI/GDRY	09/08/2019 14:15 EDT
Th234	J	7.53e-01	1.7e-01	1.0e-01	PCI/GDRY	09/08/2019 14:15 EDT
Tl208	J	2.61e-01	3.2e-02	6.6e-03	PCI/GDRY	09/08/2019 14:15 EDT
U235	J	9.33e-02	5.0e-02	3.2e-02	PCI/GDRY	09/08/2019 14:15 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10540Y	Amount analyzed:	5.759e+02 GDRY
Client sample ID:	C008-SB002-024036-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 15:25 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	88.87 %	Analyst:	JEA
Ash/dry weight:	86.80 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/20/2019 09:59	1000.0	GE18	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date
Bi212	J	1.05e+00	1.9e-01	8.9e-02	PCI/GDRY	09/08/2019 15:25 EDT
Bi214	J	4.24e+00	4.6e-01	1.3e-02	PCI/GDRY	09/08/2019 15:25 EDT
Cs137		9.29e-02	1.4e-02	5.9e-03	PCI/GDRY	09/08/2019 15:25 EDT
K40		1.24e+01	1.4e+00	6.4e-02	PCI/GDRY	09/08/2019 15:25 EDT
Pb210	J	4.52e+00	6.0e-01	1.9e-01	PCI/GDRY	09/08/2019 15:25 EDT
Pb212	J	8.99e-01	1.0e-01	1.6e-02	PCI/GDRY	09/08/2019 15:25 EDT
Pb214	J	4.83e+00	5.2e-01	1.3e-02	PCI/GDRY	09/08/2019 15:25 EDT
Ra226	J	5.86e+00	6.9e-01	1.7e-01	PCI/GDRY	09/08/2019 15:25 EDT
Ra228		9.70e-01	1.2e-01	3.2e-02	PCI/GDRY	09/08/2019 15:25 EDT
Th234	J	9.77e-01	2.8e-01	1.9e-01	PCI/GDRY	09/08/2019 15:25 EDT
Tl208	J	3.28e-01	3.9e-02	9.2e-03	PCI/GDRY	09/08/2019 15:25 EDT
U235	J	8.51e-02	7.1e-02	5.7e-02	PCI/GDRY	09/08/2019 15:25 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10541Z	Amount analyzed:	5.262e+02 GDRY
Client sample ID:	C008-SB002-060072-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 15:30 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	84.06 %	Analyst:	JEA
Ash/dry weight:	90.68 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/25/2019 13:24	1000.0	GE18	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	8.45e-01	1.7e-01	7.7e-02	1.6e-01	PCI/GDRY	09/08/2019 15:30 EDT
Bi214	J	1.87e+00	2.1e-01	1.2e-02	2.4e-02	PCI/GDRY	09/08/2019 15:30 EDT
Cs137		2.86e-02	1.0e-02	7.7e-03	1.6e-02	PCI/GDRY	09/08/2019 15:30 EDT
K40		1.05e+01	1.2e+00	5.6e-02	1.1e-01	PCI/GDRY	09/08/2019 15:30 EDT
Pb210	J	2.30e+00	3.6e-01	1.6e-01	3.3e-01	PCI/GDRY	09/08/2019 15:30 EDT
Pb212	J	7.46e-01	8.4e-02	9.2e-03	1.9e-02	PCI/GDRY	09/08/2019 15:30 EDT
Pb214	J	2.15e+00	2.4e-01	1.5e-02	3.0e-02	PCI/GDRY	09/08/2019 15:30 EDT
Ra226	J	2.63e+00	3.6e-01	1.3e-01	2.6e-01	PCI/GDRY	09/08/2019 15:30 EDT
Ra228		7.78e-01	9.3e-02	2.7e-02	5.4e-02	PCI/GDRY	09/08/2019 15:30 EDT
Th234	J	7.31e-01	2.3e-01	1.6e-01	3.2e-01	PCI/GDRY	09/08/2019 15:30 EDT
Tl208	J	2.29e-01	2.7e-02	6.1e-03	1.2e-02	PCI/GDRY	09/08/2019 15:30 EDT
U235		-2.73e-02	5.5e-02	4.2e-02	8.4e-02	PCI/GDRY	09/08/2019 15:30 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10542A	Amount analyzed:	3.138e+02 GDRY
Client sample ID:	C008-SB003-000012-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 16:15 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	91.27 %	Analyst:	JEA
Ash/dry weight:	96.18 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/20/2019 09:41	1000.0	GE16	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	9.08e-01	1.7e-01	7.1e-02	1.4e-01	PCI/GDRY	09/08/2019 16:15 EDT
Bi214	J	9.32e-01	1.0e-01	1.1e-02	2.2e-02	PCI/GDRY	09/08/2019 16:15 EDT
Cs137		2.76e-02	7.1e-03	4.0e-03	8.2e-03	PCI/GDRY	09/08/2019 16:15 EDT
K40		1.52e+01	1.7e+00	4.3e-02	8.8e-02	PCI/GDRY	09/08/2019 16:15 EDT
Pb210	J	1.03e+00	2.4e-01	1.3e-01	2.7e-01	PCI/GDRY	09/08/2019 16:15 EDT
Pb212	J	8.87e-01	1.0e-01	1.3e-02	2.5e-02	PCI/GDRY	09/08/2019 16:15 EDT
Pb214	J	1.07e+00	1.2e-01	1.3e-02	2.6e-02	PCI/GDRY	09/08/2019 16:15 EDT
Ra226	J	1.84e+00	2.7e-01	1.0e-01	2.1e-01	PCI/GDRY	09/08/2019 16:15 EDT
Ra228		8.00e-01	9.5e-02	1.8e-02	3.7e-02	PCI/GDRY	09/08/2019 16:15 EDT
Th234	J	5.73e-01	2.2e-01	1.4e-01	2.7e-01	PCI/GDRY	09/08/2019 16:15 EDT
Tl208	J	2.38e-01	2.8e-02	5.0e-03	1.0e-02	PCI/GDRY	09/08/2019 16:15 EDT
U235		5.06e-03	3.5e-02	2.8e-02	5.7e-02	PCI/GDRY	09/08/2019 16:15 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10543B	Amount analyzed:	4.652e+02 GDRY
Client sample ID:	C008-SB003-072084-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 16:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	81.19 %	Analyst:	JEA
Ash/dry weight:	73.08 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/21/2019 09:56	1000.0	GE16	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	2.34e+00	3.0e-01	7.9e-02	1.6e-01	PCI/GDRY	09/08/2019 16:20 EDT
Bi214	J	1.71e+00	1.9e-01	1.0e-02	2.1e-02	PCI/GDRY	09/08/2019 16:20 EDT
Cs137		-6.30e-03	1.0e-02	8.5e-03	1.7e-02	PCI/GDRY	09/08/2019 16:20 EDT
K40		1.10e+01	1.2e+00	5.0e-02	1.0e-01	PCI/GDRY	09/08/2019 16:20 EDT
Pb210	J	1.17e+00	2.0e-01	9.4e-02	1.9e-01	PCI/GDRY	09/08/2019 16:20 EDT
Pb212	J	2.22e+00	2.4e-01	8.9e-03	1.8e-02	PCI/GDRY	09/08/2019 16:20 EDT
Pb214	J	1.92e+00	2.3e-01	1.5e-02	3.1e-02	PCI/GDRY	09/08/2019 16:20 EDT
Ra226	J	3.51e+00	4.6e-01	1.5e-01	2.9e-01	PCI/GDRY	09/08/2019 16:20 EDT
Ra228		2.29e+00	2.5e-01	1.9e-02	3.9e-02	PCI/GDRY	09/08/2019 16:20 EDT
Th234	J	1.74e+00	2.5e-01	1.2e-01	2.4e-01	PCI/GDRY	09/08/2019 16:20 EDT
Tl208	J	7.22e-01	8.1e-02	6.8e-03	1.4e-02	PCI/GDRY	09/08/2019 16:20 EDT
U235	J	1.87e-01	6.6e-02	4.1e-02	8.3e-02	PCI/GDRY	09/08/2019 16:20 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10544C	Amount analyzed:	6.454e+02 GDRY
Client sample ID:	C008-SB004-012024-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 16:50 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	89.22 %	Analyst:	JEA
Ash/dry weight:	97.28 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/22/2019 11:14	1000.0	GE15	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	7.90e-01	1.3e-01	5.2e-02	1.1e-01	PCI/GDRY	09/08/2019 16:50 EDT
Bi214	J	5.85e-01	6.6e-02	8.3e-03	1.7e-02	PCI/GDRY	09/08/2019 16:50 EDT
Cs137		2.87e-02	6.5e-03	4.4e-03	8.8e-03	PCI/GDRY	09/08/2019 16:50 EDT
K40		1.28e+01	1.4e+00	3.0e-02	6.2e-02	PCI/GDRY	09/08/2019 16:50 EDT
Pb210	J	6.76e-01	1.8e-01	1.1e-01	2.2e-01	PCI/GDRY	09/08/2019 16:50 EDT
Pb212	J	8.58e-01	9.5e-02	9.1e-03	1.8e-02	PCI/GDRY	09/08/2019 16:50 EDT
Pb214	J	6.87e-01	7.7e-02	9.1e-03	1.8e-02	PCI/GDRY	09/08/2019 16:50 EDT
Ra226	J	1.18e+00	1.8e-01	8.1e-02	1.6e-01	PCI/GDRY	09/08/2019 16:50 EDT
Ra228		7.27e-01	8.2e-02	1.4e-02	2.9e-02	PCI/GDRY	09/08/2019 16:50 EDT
Th234	J	6.46e-01	1.9e-01	1.1e-01	2.3e-01	PCI/GDRY	09/08/2019 16:50 EDT
Tl208	J	2.27e-01	2.6e-02	3.6e-03	7.3e-03	PCI/GDRY	09/08/2019 16:50 EDT
U235		1.81e-02	3.6e-02	2.9e-02	5.9e-02	PCI/GDRY	09/08/2019 16:50 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10545D	Amount analyzed:	1.533e+02 GDRY
Client sample ID:	C008-SB004-084096-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 16:55 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	48.26 %	Analyst:	JEA
Ash/dry weight:	78.67 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/20/2019 10:01	1000.0	GE24	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date
Bi212	J	2.45e+00	3.5e-01	1.1e-01	PCI/GDRY	09/08/2019 16:55 EDT
Bi214	J	1.60e+00	1.8e-01	1.4e-02	PCI/GDRY	09/08/2019 16:55 EDT
Cs137		-8.76e-03	1.2e-02	9.4e-03	PCI/GDRY	09/08/2019 16:55 EDT
K40		9.98e+00	1.1e+00	8.6e-02	PCI/GDRY	09/08/2019 16:55 EDT
Pb210	J	1.46e+00	2.4e-01	1.1e-01	PCI/GDRY	09/08/2019 16:55 EDT
Pb212	J	2.25e+00	2.4e-01	1.1e-02	PCI/GDRY	09/08/2019 16:55 EDT
Pb214	J	1.98e+00	2.2e-01	1.8e-02	PCI/GDRY	09/08/2019 16:55 EDT
Ra226	J	3.90e+00	5.1e-01	1.5e-01	PCI/GDRY	09/08/2019 16:55 EDT
Ra228		2.17e+00	2.4e-01	2.7e-02	PCI/GDRY	09/08/2019 16:55 EDT
Th228		5.45e+00	2.8e+00	1.9e+00	PCI/GDRY	09/08/2019 16:55 EDT
Th234	J	1.91e+00	2.7e-01	1.3e-01	PCI/GDRY	09/08/2019 16:55 EDT
Tl208	J	6.69e-01	7.5e-02	8.4e-03	PCI/GDRY	09/08/2019 16:55 EDT
U235	J	1.59e-01	6.0e-02	4.1e-02	PCI/GDRY	09/08/2019 16:55 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
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SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10546E	Amount analyzed:	6.346e+02 GDRY
Client sample ID:	C008-SB005-036048-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 17:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	90.31 %	Analyst:	JEA
Ash/dry weight:	88.79 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/22/2019 11:22	1000.0	GE18	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	9.80e-01	1.9e-01	9.2e-02	1.9e-01	PCI/GDRY	09/08/2019 17:35 EDT
Bi214	J	4.54e+00	4.9e-01	1.3e-02	2.6e-02	PCI/GDRY	09/08/2019 17:35 EDT
Cs137		5.48e-02	1.2e-02	5.9e-03	1.2e-02	PCI/GDRY	09/08/2019 17:35 EDT
K40		1.31e+01	1.4e+00	6.1e-02	1.2e-01	PCI/GDRY	09/08/2019 17:35 EDT
Pb210	J	4.81e+00	6.2e-01	1.9e-01	3.8e-01	PCI/GDRY	09/08/2019 17:35 EDT
Pb212	J	7.97e-01	9.0e-02	1.5e-02	3.1e-02	PCI/GDRY	09/08/2019 17:35 EDT
Pb214	J	5.23e+00	5.7e-01	1.7e-02	3.5e-02	PCI/GDRY	09/08/2019 17:35 EDT
Ra226	J	5.88e+00	6.9e-01	1.6e-01	3.1e-01	PCI/GDRY	09/08/2019 17:35 EDT
Ra228		8.50e-01	9.9e-02	2.9e-02	5.8e-02	PCI/GDRY	09/08/2019 17:35 EDT
Th234	J	7.42e-01	2.5e-01	1.8e-01	3.6e-01	PCI/GDRY	09/08/2019 17:35 EDT
Tl208	J	2.82e-01	3.2e-02	6.5e-03	1.3e-02	PCI/GDRY	09/08/2019 17:35 EDT
U235	J	7.73e-02	6.7e-02	5.5e-02	1.1e-01	PCI/GDRY	09/08/2019 17:35 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10547F	Amount analyzed:	5.825e+02 GDRY
Client sample ID:	C008-SB005-060072-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 17:40 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	81.14 %	Analyst:	JEA
Ash/dry weight:	90.29 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/22/2019 11:24	1000.0	GE23	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	1.08e+00	1.6e-01	6.0e-02	1.2e-01	PCI/GDRY	09/08/2019 17:40 EDT
Bi214	J	1.81e+00	2.0e-01	1.1e-02	2.2e-02	PCI/GDRY	09/08/2019 17:40 EDT
Cs137		1.64e-02	7.3e-03	4.5e-03	9.2e-03	PCI/GDRY	09/08/2019 17:40 EDT
K40		1.42e+01	1.5e+00	4.9e-02	1.0e-01	PCI/GDRY	09/08/2019 17:40 EDT
Pb210	J	2.03e+00	3.4e-01	1.7e-01	3.5e-01	PCI/GDRY	09/08/2019 17:40 EDT
Pb212	J	9.27e-01	1.0e-01	1.2e-02	2.4e-02	PCI/GDRY	09/08/2019 17:40 EDT
Pb214	J	2.06e+00	2.2e-01	1.3e-02	2.6e-02	PCI/GDRY	09/08/2019 17:40 EDT
Ra226	J	2.81e+00	3.7e-01	1.3e-01	2.6e-01	PCI/GDRY	09/08/2019 17:40 EDT
Ra228		1.01e+00	1.2e-01	2.3e-02	4.6e-02	PCI/GDRY	09/08/2019 17:40 EDT
Th234	J	9.76e-01	2.6e-01	1.7e-01	3.4e-01	PCI/GDRY	09/08/2019 17:40 EDT
Tl208	J	3.21e-01	3.7e-02	5.6e-03	1.1e-02	PCI/GDRY	09/08/2019 17:40 EDT
U235	J	7.73e-02	4.8e-02	3.5e-02	7.0e-02	PCI/GDRY	09/08/2019 17:40 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10548G	Amount analyzed:	6.162e+02 GDRY
Client sample ID:	C008-SB006-024036-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-08 18:15 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.38 %	Analyst:	JEA
Ash/dry weight:	98.58 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/21/2019 09:57	1000.0	GE15	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	8.40e-01	1.3e-01	5.0e-02	1.0e-01	PCI/GDRY	09/08/2019 18:15 EDT
Bi214	J	3.71e-01	4.4e-02	8.6e-03	1.7e-02	PCI/GDRY	09/08/2019 18:15 EDT
Cs137		3.78e-03	5.9e-03	4.8e-03	9.7e-03	PCI/GDRY	09/08/2019 18:15 EDT
K40		2.36e+01	2.6e+00	3.1e-02	6.3e-02	PCI/GDRY	09/08/2019 18:15 EDT
Pb210	J	4.24e-01	1.8e-01	1.2e-01	2.4e-01	PCI/GDRY	09/08/2019 18:15 EDT
Pb212	J	8.75e-01	9.7e-02	9.3e-03	1.9e-02	PCI/GDRY	09/08/2019 18:15 EDT
Pb214	J	4.46e-01	5.2e-02	9.7e-03	2.0e-02	PCI/GDRY	09/08/2019 18:15 EDT
Ra226	J	8.03e-01	1.5e-01	8.0e-02	1.6e-01	PCI/GDRY	09/08/2019 18:15 EDT
Ra228		7.54e-01	8.5e-02	1.4e-02	2.8e-02	PCI/GDRY	09/08/2019 18:15 EDT
Th234	J	5.45e-01	1.8e-01	1.2e-01	2.3e-01	PCI/GDRY	09/08/2019 18:15 EDT
Tl208	J	2.37e-01	2.7e-02	4.3e-03	8.7e-03	PCI/GDRY	09/08/2019 18:15 EDT
U235		1.49e-02	3.7e-02	3.0e-02	6.1e-02	PCI/GDRY	09/08/2019 18:15 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10549H	Amount analyzed:	4.842e+02 GDRY
Client sample ID:	C008-SB006-060072-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-09 18:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	79.29 %	Analyst:	JEA
Ash/dry weight:	86.11 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/21/2019 09:51	1000.0	GE24	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	1.38e+00	1.9e-01	5.9e-02	1.2e-01	PCI/GDRY	09/09/2019 18:20 EDT
Bi214	J	1.20e+00	1.3e-01	9.5e-03	1.9e-02	PCI/GDRY	09/09/2019 18:20 EDT
Cs137		1.01e-02	5.7e-03	3.7e-03	7.5e-03	PCI/GDRY	09/09/2019 18:20 EDT
K40		1.41e+01	1.5e+00	3.9e-02	7.9e-02	PCI/GDRY	09/09/2019 18:20 EDT
Pb210	J	6.18e-01	1.3e-01	6.9e-02	1.4e-01	PCI/GDRY	09/09/2019 18:20 EDT
Pb212	J	1.24e+00	1.3e-01	6.9e-03	1.4e-02	PCI/GDRY	09/09/2019 18:20 EDT
Pb214	J	1.37e+00	1.6e-01	1.0e-02	2.1e-02	PCI/GDRY	09/09/2019 18:20 EDT
Ra226	J	2.23e+00	3.0e-01	1.0e-01	2.1e-01	PCI/GDRY	09/09/2019 18:20 EDT
Ra228		1.27e+00	1.4e-01	1.4e-02	2.8e-02	PCI/GDRY	09/09/2019 18:20 EDT
Th234	J	8.63e-01	1.9e-01	1.1e-01	2.1e-01	PCI/GDRY	09/09/2019 18:20 EDT
Tl208	J	3.96e-01	4.5e-02	5.4e-03	1.1e-02	PCI/GDRY	09/09/2019 18:20 EDT
U235	J	1.02e-01	5.0e-02	3.1e-02	6.3e-02	PCI/GDRY	09/09/2019 18:20 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10550A	Amount analyzed:	2.411e+02 GDRY
Client sample ID:	C008-SB007-024036-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-09 08:20 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	85.05 %	Analyst:	JEA
Ash/dry weight:	37.87 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/22/2019 11:26	1000.0	GE24	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	1.04e+00	2.0e-01	8.8e-02	1.8e-01	PCI/GDRY	09/09/2019 08:20 EDT
Bi214	J	5.34e+00	5.9e-01	1.5e-02	2.9e-02	PCI/GDRY	09/09/2019 08:20 EDT
Cs137		-6.92e-03	1.4e-02	1.1e-02	2.2e-02	PCI/GDRY	09/09/2019 08:20 EDT
K40		5.01e+00	5.8e-01	7.2e-02	1.5e-01	PCI/GDRY	09/09/2019 08:20 EDT
Pb210	J	4.27e+00	5.3e-01	1.2e-01	2.4e-01	PCI/GDRY	09/09/2019 08:20 EDT
Pb212	J	9.89e-01	1.1e-01	2.7e-02	5.5e-02	PCI/GDRY	09/09/2019 08:20 EDT
Pb214	J	6.44e+00	7.1e-01	1.8e-02	3.7e-02	PCI/GDRY	09/09/2019 08:20 EDT
Ra226	J	7.39e+00	8.6e-01	1.5e-01	3.0e-01	PCI/GDRY	09/09/2019 08:20 EDT
Ra228		9.39e-01	1.1e-01	2.3e-02	4.6e-02	PCI/GDRY	09/09/2019 08:20 EDT
Th234	J	9.80e-01	1.9e-01	1.2e-01	2.5e-01	PCI/GDRY	09/09/2019 08:20 EDT
Tl208	J	2.64e-01	3.1e-02	5.4e-03	1.1e-02	PCI/GDRY	09/09/2019 08:20 EDT
U235		-4.23e-02	7.6e-02	5.4e-02	1.1e-01	PCI/GDRY	09/09/2019 08:20 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10551B	Amount analyzed:	5.681e+02 GDRY
Client sample ID:	C008-SB007-060072-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-09 08:25 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	85.12 %	Analyst:	JEA
Ash/dry weight:	88.68 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/21/2019 09:54	1000.0	GE18	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	1.05e+00	2.0e-01	8.6e-02	1.7e-01	PCI/GDRY	09/09/2019 08:25 EDT
Bi214	J	2.97e+00	3.3e-01	1.2e-02	2.4e-02	PCI/GDRY	09/09/2019 08:25 EDT
Cs137		1.24e-02	6.1e-03	4.7e-03	9.6e-03	PCI/GDRY	09/09/2019 08:25 EDT
K40		1.21e+01	1.3e+00	5.5e-02	1.1e-01	PCI/GDRY	09/09/2019 08:25 EDT
Pb210	J	3.53e+00	4.9e-01	1.8e-01	3.6e-01	PCI/GDRY	09/09/2019 08:25 EDT
Pb212	J	8.87e-01	1.0e-01	1.0e-02	2.1e-02	PCI/GDRY	09/09/2019 08:25 EDT
Pb214	J	3.41e+00	3.8e-01	1.6e-02	3.1e-02	PCI/GDRY	09/09/2019 08:25 EDT
Ra226	J	4.32e+00	5.4e-01	1.5e-01	3.0e-01	PCI/GDRY	09/09/2019 08:25 EDT
Ra228		8.91e-01	1.0e-01	2.7e-02	5.5e-02	PCI/GDRY	09/09/2019 08:25 EDT
Th234	J	8.90e-01	2.1e-01	1.5e-01	2.9e-01	PCI/GDRY	09/09/2019 08:25 EDT
Tl208	J	2.91e-01	3.6e-02	8.9e-03	1.8e-02	PCI/GDRY	09/09/2019 08:25 EDT
U235		-2.17e-02	7.1e-02	5.4e-02	1.1e-01	PCI/GDRY	09/09/2019 08:25 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10552C	Amount analyzed:	3.471e+02 GDRY
Client sample ID:	C008-SB008-048060-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-09 09:35 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	94.57 %	Analyst:	JEA
Ash/dry weight:	98.42 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/22/2019 11:20	1000.0	GE16	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	7.69e-01	1.5e-01	6.2e-02	1.3e-01	PCI/GDRY	09/09/2019 09:35 EDT
Bi214	J	8.88e-01	9.8e-02	9.3e-03	1.9e-02	PCI/GDRY	09/09/2019 09:35 EDT
Cs137		9.17e-03	5.1e-03	3.4e-03	6.9e-03	PCI/GDRY	09/09/2019 09:35 EDT
K40		1.39e+01	1.5e+00	4.2e-02	8.6e-02	PCI/GDRY	09/09/2019 09:35 EDT
Pb210	J	8.73e-01	1.8e-01	1.1e-01	2.1e-01	PCI/GDRY	09/09/2019 09:35 EDT
Pb212	J	7.71e-01	8.7e-02	1.1e-02	2.2e-02	PCI/GDRY	09/09/2019 09:35 EDT
Pb214	J	1.02e+00	1.1e-01	1.0e-02	2.1e-02	PCI/GDRY	09/09/2019 09:35 EDT
Ra226	J	1.62e+00	2.4e-01	9.6e-02	1.9e-01	PCI/GDRY	09/09/2019 09:35 EDT
Ra228		7.18e-01	8.6e-02	2.0e-02	4.0e-02	PCI/GDRY	09/09/2019 09:35 EDT
Th234	J	3.63e-01	1.7e-01	1.1e-01	2.2e-01	PCI/GDRY	09/09/2019 09:35 EDT
Tl208	J	2.12e-01	2.5e-02	5.0e-03	1.0e-02	PCI/GDRY	09/09/2019 09:35 EDT
U235	J	3.83e-02	4.0e-02	3.3e-02	6.6e-02	PCI/GDRY	09/09/2019 09:35 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10553D	Amount analyzed:	7.000e+01 GDRY
Client sample ID:	C008-SB008-084096-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-09 09:40 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	20.50 %	Analyst:	JEA
Ash/dry weight:	27.77 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/21/2019 09:58	1000.0	GE23	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	8.89e-01	3.3e-01	1.7e-01	3.5e-01	PCI/GDRY	09/09/2019 09:40 EDT
Bi214	J	2.02e+00	2.3e-01	2.8e-02	5.7e-02	PCI/GDRY	09/09/2019 09:40 EDT
Cs137		1.27e-02	1.7e-02	1.4e-02	2.8e-02	PCI/GDRY	09/09/2019 09:40 EDT
K40		4.32e+00	5.7e-01	1.5e-01	3.2e-01	PCI/GDRY	09/09/2019 09:40 EDT
Pb210	J	2.76e+00	4.1e-01	1.8e-01	3.6e-01	PCI/GDRY	09/09/2019 09:40 EDT
Pb212	J	5.25e-01	6.9e-02	2.2e-02	4.5e-02	PCI/GDRY	09/09/2019 09:40 EDT
Pb214	J	2.55e+00	2.8e-01	3.2e-02	6.5e-02	PCI/GDRY	09/09/2019 09:40 EDT
Ra226	J	4.57e+00	7.1e-01	3.0e-01	6.0e-01	PCI/GDRY	09/09/2019 09:40 EDT
Ra228		5.41e-01	1.1e-01	4.9e-02	1.0e-01	PCI/GDRY	09/09/2019 09:40 EDT
Th234	J	1.57e+00	3.6e-01	2.2e-01	4.5e-01	PCI/GDRY	09/09/2019 09:40 EDT
Tl208	J	2.03e-01	3.6e-02	1.4e-02	2.9e-02	PCI/GDRY	09/09/2019 09:40 EDT
U235		3.25e-02	8.1e-02	6.1e-02	1.2e-01	PCI/GDRY	09/09/2019 09:40 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10554E	Amount analyzed:	3.242e+02 GDRY
Client sample ID:	C008-SB009-000012-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-09 10:00 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	95.17 %	Analyst:	JEA
Ash/dry weight:	96.68 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/25/2019 13:58	1000.0	GE16	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	1.04e+00	1.9e-01	7.3e-02	1.5e-01	PCI/GDRY	09/09/2019 10:00 EDT
Bi214	J	9.81e-01	1.1e-01	1.0e-02	2.0e-02	PCI/GDRY	09/09/2019 10:00 EDT
Cs137		3.04e-02	8.0e-03	4.3e-03	8.8e-03	PCI/GDRY	09/09/2019 10:00 EDT
K40		1.42e+01	1.6e+00	4.4e-02	9.0e-02	PCI/GDRY	09/09/2019 10:00 EDT
Pb210	J	1.06e+00	2.3e-01	1.3e-01	2.6e-01	PCI/GDRY	09/09/2019 10:00 EDT
Pb212	J	9.34e-01	1.0e-01	1.2e-02	2.5e-02	PCI/GDRY	09/09/2019 10:00 EDT
Pb214	J	1.11e+00	1.2e-01	1.3e-02	2.7e-02	PCI/GDRY	09/09/2019 10:00 EDT
Ra226	J	1.93e+00	2.9e-01	1.1e-01	2.3e-01	PCI/GDRY	09/09/2019 10:00 EDT
Ra228		8.17e-01	9.4e-02	1.9e-02	3.8e-02	PCI/GDRY	09/09/2019 10:00 EDT
Th234	J	6.65e-01	1.9e-01	1.2e-01	2.4e-01	PCI/GDRY	09/09/2019 10:00 EDT
Tl208	J	2.58e-01	3.0e-02	5.4e-03	1.1e-02	PCI/GDRY	09/09/2019 10:00 EDT
U235	J	3.55e-02	4.3e-02	3.5e-02	7.1e-02	PCI/GDRY	09/09/2019 10:00 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	B9.10555F	Amount analyzed:	6.337e+02 GDRY
Client sample ID:	C008-SB009-072084-01	Preparation batch #:	0016824G
Matrix:	SOIL	Assay batch #:	0024721G
Collected:	2019-09-09 10:05 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	84.76 %	Analyst:	JEA
Ash/dry weight:	93.63 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/25/2019 14:01	1000.0	GE15	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date	
Bi212	J	8.03e-01	1.3e-01	5.1e-02	1.0e-01	PCI/GDRY	09/09/2019 10:05 EDT
Bi214	J	6.28e-01	7.1e-02	8.4e-03	1.7e-02	PCI/GDRY	09/09/2019 10:05 EDT
Cs137		-3.69e-03	5.5e-03	4.5e-03	9.0e-03	PCI/GDRY	09/09/2019 10:05 EDT
K40		1.32e+01	1.4e+00	3.5e-02	7.2e-02	PCI/GDRY	09/09/2019 10:05 EDT
Pb210	J	7.76e-01	2.0e-01	1.2e-01	2.4e-01	PCI/GDRY	09/09/2019 10:05 EDT
Pb212	J	8.09e-01	9.0e-02	9.6e-03	1.9e-02	PCI/GDRY	09/09/2019 10:05 EDT
Pb214	J	7.47e-01	8.3e-02	9.5e-03	1.9e-02	PCI/GDRY	09/09/2019 10:05 EDT
Ra226	J	1.27e+00	2.0e-01	8.4e-02	1.7e-01	PCI/GDRY	09/09/2019 10:05 EDT
Ra228		6.92e-01	7.8e-02	1.4e-02	2.9e-02	PCI/GDRY	09/09/2019 10:05 EDT
Th234	J	4.71e-01	1.7e-01	1.1e-01	2.2e-01	PCI/GDRY	09/09/2019 10:05 EDT
Tl208	J	2.13e-01	2.5e-02	4.2e-03	8.4e-03	PCI/GDRY	09/09/2019 10:05 EDT
U235		2.58e-03	3.6e-02	3.0e-02	6.0e-02	PCI/GDRY	09/09/2019 10:05 EDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	LCS-00786576D	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0016824G
Matrix:	N/A	Assay batch #:	0024721G
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	JEA
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/19/2019 14:13	1000.0	GE23	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date
Am241	4.34e+04	4.8e+03	4.8e+01	9.5e+01	PCI	10/01/2016 12:00 CDT
Co60	2.52e+04	2.7e+03	9.9e+00	2.0e+01	PCI	10/01/2016 12:00 CDT
Cs137	1.66e+04	1.8e+03	1.4e+01	2.8e+01	PCI	10/01/2016 12:00 CDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1900152

SAMPLE ANALYSIS REPORT

Lab sample #:	RBK-00786575C	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0016824G
Matrix:	N/A	Assay batch #:	0024721G
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL GAM-01-RA
Dry/wet weight:	N/A	Analyst:	JEA
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
11/20/2019 10:08	1000.0	GE23	JEA

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	DLC	MDC	Unit	Reference Date
Bi212	1.55e+01	2.7e+01	1.8e+01	3.7e+01	PCI	11/18/2019 09:30 CST
Bi214	9.07e-01	5.6e+00	3.7e+00	7.5e+00	PCI	11/18/2019 09:30 CST
Cs137	4.43e-01	2.0e+00	1.3e+00	2.8e+00	PCI	11/18/2019 09:30 CST
K40	1.20e+01	2.6e+01	1.7e+01	3.6e+01	PCI	11/18/2019 09:30 CST
Pb210	-4.18e+01	6.9e+01	4.8e+01	9.8e+01	PCI	11/18/2019 09:30 CST
Pb212	8.89e-01	3.9e+00	2.7e+00	5.4e+00	PCI	11/18/2019 09:30 CST
Pb214	-3.61e+00	5.6e+00	3.7e+00	7.5e+00	PCI	11/18/2019 09:30 CST
Ra226	-3.16e+01	5.8e+01	3.7e+01	7.4e+01	PCI	11/18/2019 09:30 CST
Ra228	2.96e-01	9.3e+00	5.5e+00	1.1e+01	PCI	11/18/2019 09:30 CST
Th234	1.94e+01	5.8e+01	3.9e+01	8.0e+01	PCI	11/18/2019 09:30 CST
Tl208	-1.71e-02	2.2e+00	1.5e+00	3.1e+00	PCI	11/18/2019 09:30 CST

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG 1900152

PREPARATION BATCH SUMMARY

Preparation batch #: 0016824G
 Analysis method: NAREL GAM-01-RA
 Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	$\pm 2 \sigma$ Uncertainty	Analyst
B9.10537D	C008-SB001-036048-01	00783842P		N/A		JEA
B9.10537D	C008-SB001-036048-01	00786574B	DUP	N/A		JEA
B9.10538E	C008-SB001-036048-02	00783846U		N/A		JEA
B9.10539F	C008-SB001-108120-01	00783850P		N/A		JEA
B9.10540Y	C008-SB002-024036-01	00783854U		N/A		JEA
B9.10541Z	C008-SB002-060072-01	00783858Y		N/A		JEA
B9.10542A	C008-SB003-000012-01	00783862U		N/A		JEA
B9.10543B	C008-SB003-072084-01	00783866Y		N/A		JEA
B9.10544C	C008-SB004-012024-01	00783870U		N/A		JEA
B9.10545D	C008-SB004-084096-01	00783874Y		N/A		JEA
B9.10546E	C008-SB005-036048-01	00783878C		N/A		JEA
B9.10547F	C008-SB005-060072-01	00783882Y		N/A		JEA
B9.10548G	C008-SB006-024036-01	00783886C		N/A		JEA
B9.10549H	C008-SB006-060072-01	00783890Y		N/A		JEA
B9.10550A	C008-SB007-024036-01	00783894C		N/A		JEA
B9.10551B	C008-SB007-060072-01	00783898G		N/A		JEA
B9.10552C	C008-SB008-048060-01	00783902J		N/A		JEA
B9.10553D	C008-SB008-084096-01	00783906N		N/A		JEA
B9.10554E	C008-SB009-000012-01	00783910J		N/A		JEA
B9.10555F	C008-SB009-072084-01	00783914N		N/A		JEA
LCS-00786576D *		00786576D	LCS	N/A		JEA
RBK-00786575C *		00786575C	RBK	N/A		JEA

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0016824G

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B9.10537D	00786574B	DUP	BI212		0.7	0.05	PASS-J
B9.10537D	00786574B	DUP	BI214		0.6	0.08	PASS-J
B9.10537D	00786574B	DUP	CS137		3.4	-0.17	PASS
B9.10537D	00786574B	DUP	K40		0.6	0.07	PASS
B9.10537D	00786574B	DUP	PB210		0.9	0.08	PASS-J
B9.10537D	00786574B	DUP	PB212		10.2	1.29	PASS-J
B9.10537D	00786574B	DUP	PB214		0.0	0.00	PASS-J
B9.10537D	00786574B	DUP	RA226		0.3	-0.03	PASS-J
B9.10537D	00786574B	DUP	RA228		5.4	0.66	PASS
B9.10537D	00786574B	DUP	TH234		20.8	0.70	PASS-J
B9.10537D	00786574B	DUP	TL208		2.0	-0.23	PASS-J
B9.10537D	00786574B	DUP	U235		32.8	0.26	PASS
LCS-00786576D	00786576D	LCS	AM241	104.8		0.79	PASS
LCS-00786576D	00786576D	LCS	CO60	99.9		-0.02	PASS
LCS-00786576D	00786576D	LCS	CS137	104.1		0.69	PASS
RBK-00786575C	00786575C	RBK	BI212				PASS
RBK-00786575C	00786575C	RBK	BI214				PASS
RBK-00786575C	00786575C	RBK	CS137				PASS
RBK-00786575C	00786575C	RBK	K40				PASS
RBK-00786575C	00786575C	RBK	PB210				PASS
RBK-00786575C	00786575C	RBK	PB212				PASS
RBK-00786575C	00786575C	RBK	PB214				PASS
RBK-00786575C	00786575C	RBK	RA226				PASS
RBK-00786575C	00786575C	RBK	RA228				PASS
RBK-00786575C	00786575C	RBK	TH234				PASS
RBK-00786575C	00786575C	RBK	TL208				PASS

Note: Results qualified with -J may be significantly under or over-estimated and are not evaluated for QC purposes.